

## Hammer, Edward

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**From:** Minahan, Kristi L - DNR <Kristi.Minahan@wisconsin.gov>  
**Sent:** Wednesday, March 28, 2018 10:52 AM  
**To:** Anson, Robie; Pfeifer, David; Hammer, Edward; Hemken, Meghan  
**Subject:** info on proposed chl a Aqu Life threshold

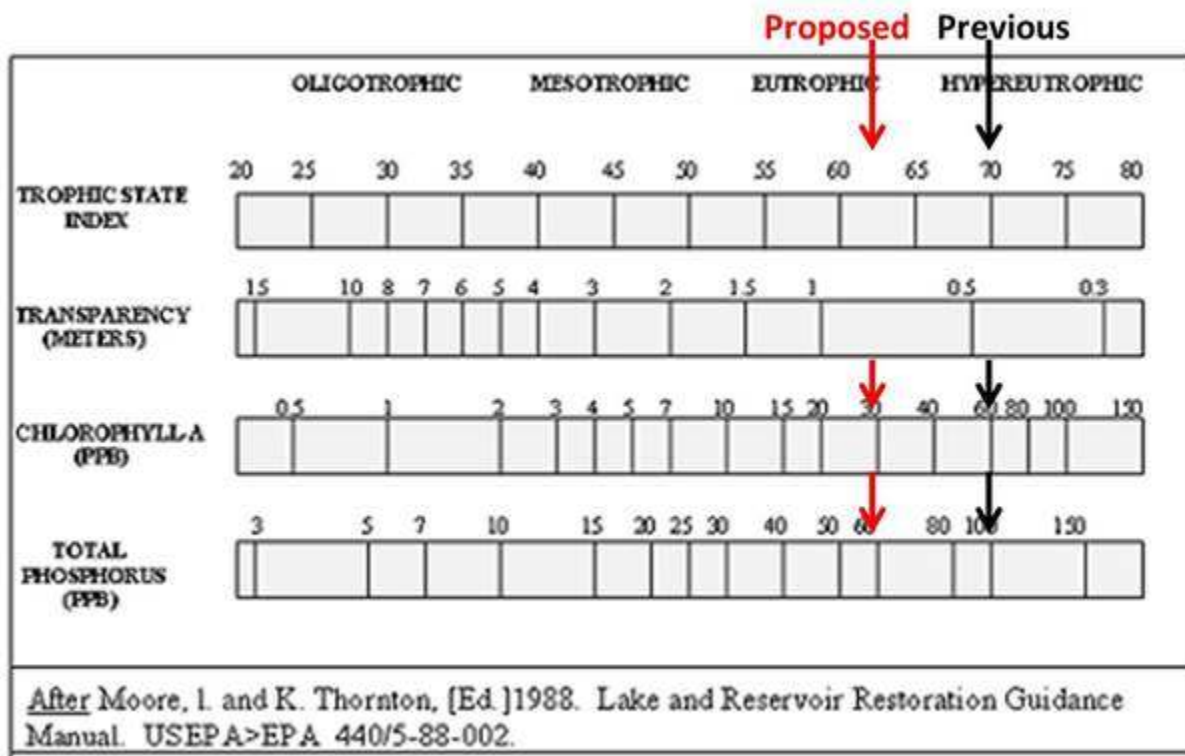
Hi Robie. At a previous advisory committee meeting, you had asked how the Aquatic Life lake criteria for chl a was set at 27 ug/L chl a. Here's an excerpt from the technical support document that explains it, followed by a couple slides we used at previous meetings. We'd been using the 27 as the threshold for deep lakes for some time in WisCALM, but the shallow lakes had had a threshold of 60. This rule removes the threshold of 60 and brings both deep & shallow to 27. The thresholds are based on the Carlson Trophic State Index & what chl a concentrations correlate to different trophic states. Because this is an aquatic life threshold, and fish can typically do fine in more eutrophic systems, the line was drawn at the upper end of eutrophic but before reaching hypereutrophic. In Figure 17 below, see the third row down, chl a. Let me know if you have additional questions/comments. -Kristi

### Comparison of chlorophyll *a* combined criteria to current WisCALM thresholds

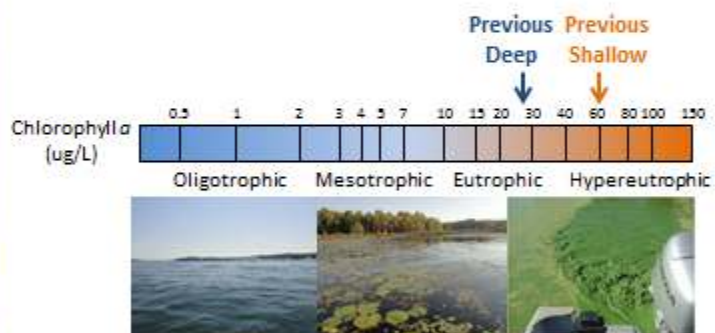
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Secondly, the chlorophyll *a* threshold for Aquatic Life in shallow lakes changed from 60 ug/L in the previous WisCALM guidance to 27 ug/L in this proposal. The previous threshold of 60 ug/L represented the point at which shallow lakes shift from an aquatic plant-dominated to an algal-dominated state (Jeppesen et al. 1990, Figure 17). However, limnological research indicates that 60 ug/L was an inadequate level of protection because it is extremely difficult to shift a lake back to a plant-dominated, clear water state once it has reached an algal-dominated state. The new criterion (27 ug/L) proposed for both shallow and deep lakes represents expected chlorophyll *a* values at lakes that have a trophic status at the high end of eutrophic but that have not yet become hyper-eutrophic (Trophic State Index (TSI) of 63). At this stage, the lake still may be restored to a clear water state. The chlorophyll *a* threshold for deep lakes remains the same as previous versions of WisCALM, as it was originally set at 27 ug/L chl a to represent a TSI of 63.

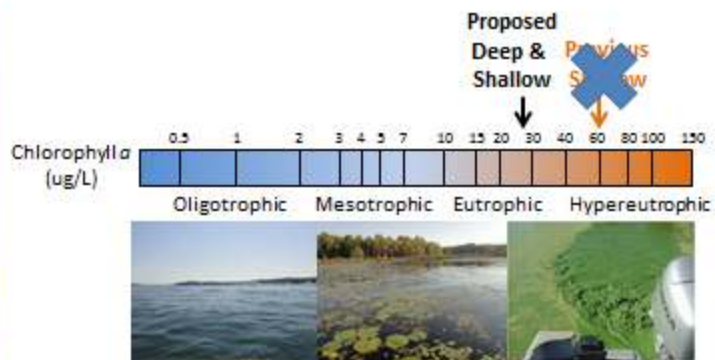
Figure 17. Continuum of lake trophic status in relation to Carlson Trophic State Index. Previous WisCALM guidance for shallow lakes set the threshold in the hypereutrophic range, but the proposed criteria are at the upper end of eutrophic.



## Previous Aquatic Life Criteria at Eutrophic - Hypereutrophic



## New Aquatic Life Criteria at Upper End of Eutrophic



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